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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/569,555	04/27/2006	Martine Dubois	0512-1325	7642

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EXAMINER	
SHECHTMAN, SEAN P	
ART UNIT	PAPER NUMBER
2121	

MAIL DATE	DELIVERY MODE
10/22/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/569,555	DUBOIS ET AL.	
	Examiner	Art Unit	
	Sean P. Shechtman	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 September 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *44-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *44,52,53,55 and 56* is/are rejected.

7)☒ Claim(s) *45-51,54 and 57* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. Objection withdrawn.

Claim Rejections - 35 USC § 112

2. Rejections withdrawn.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 44, 52, 53, 55, 56 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Pat. No. 6,401,002 to Jang et al (hereinafter referred to as Jang).

Jang teaches the following:

44. A method for producing a three-dimensional multi-material component by the ink-jet-type printing of droplets of at least one material in successive layers (Abstract, Col. 5, lines 45 – Col. 10, lines 24; Fig. 1, 2, 5; Col. 11, lines 1 - Col. 12, line 51, inkjet, droplets, making 3D object), comprising the steps of:

cutting up a representation of the multi-material component into characteristic objects (Fig. 5, Col. 16, line 39 - Col. 20, line 31, triangles segments);

slicing the representation of the component into print layers as a function of said characteristic objects (Fig. 5, Col. 16, line 39 - Col. 20, line 31, during “the slicing step, neighboring data points with the same color code on the same layer may be sorted together”,“triangles may be so chosen that each triangle covers one and only one color. In a conventional .STL file, each triangular facet is represented by three vertex points

each having three coordinate points, (x.sub.1,y.sub.1,z.sub.1), (x.sub.2,y.sub.2,z.sub.2), and (x.sub.3,y.sub.3,z.sub.3), and a unit normal vector (i,j,k). Each facet is now further endowed with a color code.);

establishing a plurality of discrete spatial print path trajectories for each print layer (Fig. 5, Col. 7, lines 60 – Col. 8, line 26, motion controlled devices moving relative to one another in an X-Y plane defined by first and second directions (X and Y directions) and in a third direction (Z-direction), controlled by computer system in accordance with CAD-generated data files, "layer data are then converted to machine control languages that can be used to drive the operation of the functional components, including motion devices. These motion devices operate to provide relative translational motion of the material depositing sub-system with respect to the object platform in a horizontal direction within the X-Y plane"; Col. 16, line 39 - Col. 20, line 31, "These segment data are then converted into programmed signals (data for selecting deposition tools and tool paths)", See also Fig. 5, generate paths for each layer and feedback control to generate path for next layer);

establishing a set of printing parameters as a function of the nature of the materials deposited and the deposition conditions thereof for each print layer and for each discrete spatial trajectory (Fig. 5, Col. 7, lines 60 – Col. 8, line 26, eject droplets of correct liquid compositions at desired proportions and rates);

establishing a spatial and temporal sequencing law for a print path for said print layers and for said discrete spatial trajectories as a function of the objects, their relative three-dimensional arrangement and the characteristics of the printer, in order to

optimise the process of depositing each print layer (Fig. 5, Col. 7, lines 60 – Col. 8, line 26; Col. 20, lines 10-30, variation in composition represented mathematically within the data package for each layer and used to control the composition of materials deposited; Col. 22, lines 15-35, "creating an image of the object on a computer with the image including a plurality of segments defining the object and with each of the segments being coded with a color defined by the operation of a specific set of selected channels; (e) generating programmed signals corresponding to each of these segments (segments are in space) in a predetermined sequence; (f) operating the pulse generator (actuator means) in response to the programmed signals to activate selected channels; and (g) moving the deposition sub-system and the platform relative to one another in response to the programmed signals"; Col. 25, lines 40-50, generating program signals corresponding to each of the segments in a predetermined sequence, wherein said program signals determine movement in predetermined patterns (spatial) and ejection of droplets of correct rates (temporal), is establishing a spatial and temporal sequencing law for the print path for said print layers and for said discrete spatial trajectories; Fig. 5 shows this is a function of the slicing which is a function of the triangles and their relative three-dimensional arrangement; Fig. 5 also shows this is feedback controlled wherein the output of the last layers measured, is characteristics of the printer; Col. 17, lines 23-33, adaptive layer slicing, optimising the process of depositing each print layer).

52. The method according to claim 44, wherein one of the printing parameters is the size and shape of the ejected material droplets, said method consisting in controlling the size and the shape of each droplet of materials to be ejected, as a function of the

nature of the materials, the deposition conditions thereof and predetermined print layer thicknesses (Fig. 5, Col. 7, lines 60 – Col. 8, line 26, eject droplets of correct liquid compositions at desired proportions and rates).

53. The method according to claim 44, wherein one of the printing parameters is the temperature of the materials prior to ejection, said method consisting in controlling the temperature of these materials prior to ejection of each droplet, as a function of the nature of these materials and the type of ejection means (Fig. 1, Col. 11, lines 1- Col. 12, line 51).

55. The method according to claim 44, wherein one of the printing parameters is the storage state of the materials, said method consisting in controlling the material state characteristics by controlling the temperature, controlling the pressure and controlling the state of dispersion of the stored materials as a function of their nature in order to optimise the material storage conditions (Fig. 1, Col. 11, lines 1- Col. 12, line 51).

56. The method according to claim 44, wherein one of the printing parameters is the state of the printing environment, said method consisting in controlling the characteristics of the environment in which the multi-material component is produced as a function of the nature of the deposited materials (Fig. 1, Col. 11, lines 1- Col. 12, line 51).

Response to Arguments

4. Applicant's arguments filed 9/24/09 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., cutting up characteristic objects into several print layers) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Allowable Subject Matter

5. Claims 45, 46-51, 54, 57 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Referring to claims 45, 46-51, 54, 57, Jang, fails to teach and it would not be obvious to a person of ordinary skill in the art to combine with Jang, a method for producing a three-dimensional multi-material component by the ink-jet-type printing of droplets of at least one material in successive layers having all the claimed features of applicant's instant invention, specifically including:

"wherein the slicing of the representation of the multi-material composite consists in maximising the quantity of materials deposited per print layer".

"determining a first modulation of discrete spatial print path trajectories for each print layer; determining at least one predetermined direction of discrete spatial print path trajectory for each print layer; determining a second modulation of the discrete spatial print path trajectory from a current layer to the following layer for two successive print

layers of the same object, said second modulation depending on the number of constituent layers to be deposited for said object in order to optimise the cohesion of the final structure of said multi-material component".

"wherein the spatial and temporal sequencing law for print path of the print layers and the discrete spatial trajectories comprises a plurality of printing instructions and of successive cleanings of the ejection system".

"wherein one of the printing parameters is the ejection distance orthogonal to the deposition surface, said method consisting in regulating said ejection distance around nominal values, the nominal values being determined so as to optimise the deposition of the materials on the deposition surface".

"wherein one of the printing parameters is the degree of obstruction of the ejection system, said method consisting in cleaning the ejection system once the degree of obstruction exceeds a predetermined obstruction threshold value".

"wherein one of the printing parameters is the power and wavelength of a radiation applied to the deposited materials as a function of the nature of the deposited materials".

Conclusion

6. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sean P. Shechtman whose telephone number is (571)272-3754. The examiner can normally be reached on 9:30am-6:00pm, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SPS
Sean P. Shechtman

October 18, 2009

/Sean P. Shechtman/
Primary Examiner, Art Unit 2121